pansion and the dynamic development of the profession and practice in the Czech Republic. Currently, no comprehensive system of education - substitutes for Facility Management. You can name just one week training cycle at the Faculty of Business Economics in Prague (Department of Management), which does not include the most important technical and operational aspects of Facility Management, and professional conferences organized by the Czech branch of the IFMA. Faculty of Civil Engineering of the Technical University of Ostrava with the advent of new research and training in Facility Management plans to meet labor market demand for this new profession.

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ENVIRONMENTAL PROJECT RISKS DEFINITION

Abstract

Project risk management is one of the deciding factors differentiating a systematic approach to a process from an intuitive one. Obviously, the same is true in the case of environmental projects. The process of risk management occurs in all project phases. Its aim is to identify the sources of possible losses in advance and consequently, through active work with risks, to restrict the likelihood of their appearance and seriousness to the acceptable value. The aim of this thesis is to define basic procedures in the course of risks recognition in environmental projects.

Key words

Risk, hazard, project, flow chart, checklist

Introduction

In the framework of environmental projects, risks are represented by uncertain cases or situations with possibly negative impacts that could influence a project's success or partial outcomes, or by those events in a project which can cause unpredictable damage. Risks can occur in any kind of project regardless of their range and complexity, both in manufacturing and among service providers. Risk management in environmental projects is one of the deciding factors differentiating a systematic approach to a process from an intuitive one. The process of risk management occurs in all project phases (STANÍČEK Z., HAJKR J., MOTAL M., MÁCHAL P., PITAŠ J., 2008). Its aim is to identify the sources of possible losses in advance and consequently, through active work with risks, to restrict the likelihood of their appearance and seriousness to the acceptable val-

ue. In case there is damage caused despite all measures taken, risk management provides a set of corrective arrangements in advance. Successful risk handling assumes expert activity. The operation of expert activity is defined by, e.g., LINHARTOVÁ D. (2008) as an activity fulfilling the role of a specialized expert or adviser for its bearer, both in the field of education and in expert-focused issues.

Materials and Methods

In the course of processing a project, we should pay attention to risk handling at each phase of the project. According to DOLEŽAL P., MÁCHAL P., LACKO B. (2009), risk management and risk identification is an ongoing process influencing the project from its primary stage to its goal achievement. Risk management is based on risk engineering, a technical-economic branch (TICHÝ M., 2006). Project management works with more methods of risk management. This thesis aims at defining basic procedures in the course of risks recognition in environmental projects.

Conclusion and Discussion

IPMA COMPETENCE BASELINE (2005) distinguishes the terms of threat (hazard) and risk. A threat is defined as the possible danger of an unfavorable event influencing a certain group of interests.

A risk is defined as the value of an assumed loss in monetary units, expressed by the continuous or discrete quantity Rs, covering a vast range of various values. However, real life experience represents as risks qualitatively different but related aspects, e.g. threats or sources of threats being represented by the potential threat of an unfavorable event with negative impacts.

The definition of environmental project risks has to be based on the following issues:

1) threat identification;
2) threat scenario analysis;
3) threat evaluation.

The outcomes of the above issues which solve the basic operations of risk engineering are as follows:

1) Sc – threat scenario;
2) L – likelihood of threat scenario occurrence;
3) I – impact.

If we can determine P and D values for the Sc scenario, it is possible to establish risk based on the $Rsi = \sum PiDi$ relation. The Sc threat scenario does not represent a mathematical quantity. The term of Sc threat scenario defines the facts determining risk evaluation. Above all it is necessary to be aware of the possible threats and the impacts they can have on a project.

The hazard occurrence likelihood L is a numerical quantity of increasing values P [0;1]. The L quantity can be assessed with the help of either statistical

analysis of known facts or exact methods or simple engineering estimation (in case we are not able to assess it another way, which happens quite often) based on the reliability experience model. As for the Sc quantity changing in the course of time, the L quantity has to be assessed depending on time (i.e. the L marked with a stripe standing for its depending on time). In case the risk occurrence likelihood cannot be determined, it cannot be linked with risk by any means.

The I impact represents the potential harm caused by implementing the threat scenario expressed in monetary units. The impact is a time-dependent quantity too, because the value of the premises, services or program changes in time. The impact arisen from harm done on the property of a person involved can be expressed in financial terms.

The following table presents the use of the above terms in the case of a supplier offers evaluation for the construction of a photovoltaic power station.

	Value	Supplier A	Supplier B	Supplier C	Supplier E
Offer Price	CZK (in thousands)	12,600	12,300	12,700	12,100
Threat	Description	Low outcome quality	Violation of contracted terms	Essential risks are not known	Bad communication during contract conclusion
Occurrence likelihood	%	30	45	10	60
Impact	CZK	550	500	100	1,000
Risk Value	CZK	1,550	2,250	100	6,000
Price Increase	CZK	14,250	14,550	12,800	18,100

Examples of the financial impact caused to the property

Establishing the threat scenario is a demanding task for a risk engineer analysing the processes and products of a complex project. The problem requires a methodical approach in which the scenario is matched to the defined threat (what happens, if….) or the defined threat to the known scenario (what is the cause of…).

Project management quality ISO standards require that threats identification, follow-up documentation and responsibility documentation all proceed from the structural project plan. This way we can identify every possible risk in each work package both from the autonomous and the mutual bonds point of view. Threat is mainly differentiated in terms of deadlines, expenses and product

quality. Thus, lists of unidentified risks related to particular work packages and of people responsible for risk elimination are established. The information arising from these lists can be processed further by means of evaluation tables, which can be subsequently used according to methods set beforehand and adjusted according to appropriate classification tools, represented by:

1) checklists, which should ensure that no risks are ignored. Checklists are usually presented formally (i.e., table, form). Risk identification and evaluation are usually based on long-term statistics and analyses. Special attention is paid to new materials, products, services, technologies, procedures, etc. Possible failures arising from the most important subcontractors are elaborated in detail. The checklists can be drawn-up as:

- lists of questions with favorable answers, given after exploring a certain situation. In case we cannot provide a favorable answer, it is necessary to implement arranged measures or other steps that will enable a favorable reply to a repeated question;
- lists of commands defining certain activities which come into operation in the case of risks elimination;

2) flowcharts. These are diagrams showing how particular system components are related. They are commonly used in quality control. These flowcharts can help the project team predict what problems can arise and in which part of the project. The charts are usually;

- cause and effect charts (Ishikava´s charts);
- systemic or process flow charts showing the relations between individual components of a system;

3) sophisticated systems. Such systems focus on searching for possible sources of a project failure. For that purpose we can use procedures typical for particular technical, financial and social areas. These systems identify the sources of failures and provide measures leading to the elimination of risks in future projects. They are mainly used in the case of investment projects.

Summary

A risk is defined as the value of a probable loss expressed in monetary units, described by a continuous or discrete quantity. In contrast, a threat is defined as a potential danger represented by the possible occurrence of unfavorable events influencing a certain group of interest.

The definition of environmental risks is based on a determination of the following issues:

1) threat identification;
2) threat scenario analysis;
3) threat evaluation.

Establishing a threat scenario is a demanding task for a risk engineer analysing the processes and products of a complex project. Project management

quality ISO standards require that threats identification, follow-up documentation and responsibility documentation all proceed from the structural project plan.

Lists of unidentified risks related to particular work packages and of people responsible for risk elimination have been established. The information arising from these lists can be processed further by means of evaluation tables, which can be subsequently used according to the methods set beforehand and adjusted according to appropriate classification tools, represented by:

- check-lists, which should ensure that no risks are ignored;
- flowcharts, showing how particular system components are related;
- sophisticated systems, focusing on searching for possible sources of a project failure. For that purpose we can use procedures typical for particular technical, financial and social areas.

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FACILITY MANAGEMENT OUTSOURCING

OKIN FACILITY, one of the main suppliers of Facility services for corporations in the Czech Republic, Eastern Europe, Russia expects a growth in demand from the industry in integrated facilities (Facility Management).

By outsourcing Facility Management are showing great interest not only in the Czech Republic but also abroad. The trend in the last two or three years shows that customers refuse to small local companies, whose offerings include a limited set of services for the Facility Management, in favor of the major service providers. Company's clients will range of support industries largest providers offering a full range of services throughout the Czech Republic.

OKIN FACILITY expects that the integration of Facility Management services within a single vendor will be on the rise in the coming years. During an economic downturn, companies view their spending more carefully. They often have no idea where to find the hidden potential in the workplace.

For large enterprises, the outsourcing of support services (Facility Management) usually gives an annual saving of 10 to 20 % of the cost of such activities. As the experience of OKIN FACILITY last year, the savings is about 100 000 euros per year. According to the survey, large industrial facilities spend an average of 1 million euros per year on infrastructure management and other services associated with it. Our experience shows that companies often do not